A CONSIDERATION OF CONGENITAL DISLOCATION OF THE HIP.*

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THE study of congenital dislocation of the hip, began, so far as its present development is concerned, by Hoffa in 189—, has gone on by definite steps—the scientific advance being quite undisturbed by the hysterical wave, begotten and nourished by the irresponsible daily newspapers, in 1902, when Lorenz came to this country.

Hoffa's first plan was to gain access to the site of the acetabulum by an incision behind the trochanter, necessitating the cutting of important pelvi-trochanteric muscles. Not only was this a disadvantage in itself, but the acetabulum had to be approached by a devious and difficult path between the ilium and the femoral head. Lorenz improved the technique immensely when he devised, advocated and practiced the making of the incision anterior to the trochanter, approaching the acetabulum directly and without really cutting any muscles, for the incision was made in the direction of the muscular fibres and was a muscle splitting and not a muscle cutting. In each operation the acetabulum was deepened and enlarged to make an incompetent into a competent socket, it being the belief then, that the chief deformity lay in the saucer shape of the acetabulum. That the Lorenz incision was the better, Hoffa acknowledged by adopting it, and in 1895, when I was in Wurzburg, it was the incision he was using. The method was a satisfactory one so far as putting the femoral head into an acetabulum was concerned, but the results were in many, very many instances, disappointing. This I found out in my own cases in which I had followed carefully the Hoffa-Lorenz technique, for not a few reluxated and others became anchylosed.

The reluxations were surely due to the impossibility of adapting the acetabulum to the head and the head to the acetabulum. Each bone was deformed, the acetabulum being anything from a cup-like hollow, or a saucer-like hollow to a little patch of cartilage in the shape of an ear or pear, in the proper site, but with no hollow at all, and the head being anything from a practically normal head to a little cartilage-encrusted nubble of bone on the side of the femur. Neither fitted, and the remodelling of either to exactly fit the other so that an anatomical result and a satisfactory function might be secured, proved an impossibility. It seems to me that this difficulty in the proposition must be so plain that further remarks on it are not necessary.

The cases which became and remained anchylosed require more comment. In these cases the hips were found, after the operation wounds had healed, to be in proper position—the head in the acetabulum—but while they had at first an ample practical range of motion they soon came to have only a limited range of motion and finally no motion at all. From this point two courses were apparently possible; either the anchylosis became firmer and firmer, or after a time it gradually became less, and an amount of motion developed which was ample in range for ordinary uses; that is, ample practical motion was secured. The cause of the anchylosis was a pertinent one, and, while I cannot speak from the standpoint of one who has opened a joint at this time and seen the condition inside it, I can speak from the standpoint of one who has examined and manipulated such joints. The explanation offered is reasonable and simple. From the cancellous tissue of the deepened acetabulum, the cartilage having been removed in the process of deepening, granulation tissue grew for the purpose of repair. This adhered to and enveloped the femoral head, and as it became older and firmer, less cellular and more fibrous, it contracted and fastened the head more and more firmly in one position. It seemed that this condition could be almost seen, so perfectly does the explanation account for the sensation gotten by forcibly moving the hip in this stage, while the child is anesthetized. At first, resistance was encountered; then this yielded as if something tore and motion was permitted, but with crepitation in the joint, which was softer and moister in those manipulated earlier, and harder and drier in those manipulated later. In the cases that remained anchylosed this bond—not disturbed by manipulation or reforming after it—became stronger and shorter, while in those that gradually secured practical motion there must have developed a pseudo-arthrosis between the femoral head and the granulation tissue or fibrous tissue floor of the acetabulum, and it is not inconceivable that there was a regeneration of articular cartilage so that in time, an approximation to a normal acetabulum resulted.

However, the results in these cases—though only nine or ten in number—were not good enough to satisfy me. I was quite ready for the next step when it came.

In 1887 Paci, of Pisa, began the reduction of congenital dislocation of the hips by manipulation, using circumduction movements, as in accidental dislocations, but in all his actions he was careful to commit no trauma. Lorenz saw the method demonstrated in 1894, and some time after he had returned home he tried it, and believing that he got good results from it he has continued the practice of it. Lorenz, however, practiced and advocated the use of great force, putting the limb into unnatural abduction, forcing the femoral head with violence to and, if he could, into the acetabulum and this with the result of committing traumatisms not inconsiderable in character or number. These include fractures of the femur and of the pelvis; paralysis of the anterior crural and sciatic nerves; rupture of the femoral vein and one case of total gangrene of the limb. In addition he had deaths due to chloroform and to shock. Other operators by the method reported similar casualties. Hoffa and Heusner tore the vulva and the urethra, fractured bones and separated their epiphyses, had paralysis of the nerves of the part, and got large hematomata, some of which suppurated. Kummel states that unfortunate occurrences are not rare, and Ridlon, who has but recently published his statistics, acknowledges fractures of the femur.

Finally from personal observation in the course of operation on one of Lorenz's cases, I know that he lacerated the capsule, thrust the head through the rent and left it outside the joint, among the muscles in the outer part of Scarpa's space, where it could be felt just beneath the fascia lata. And I have seen other cases where the head was in this same superficial location which it could only have reached, I believe, by a similar mutilation. These confessions of disasters are quoted from various recent publications, chiefly a paper by Davis of Philadelphia, in the *American Journal of Medical Sciences* of 1903. But when I, sometime in 1897, first began the use of the method, —the method of reduction by manipulation, which has come to be known as the "bloodless" method, but which should be called, because of the man who originated it and the other who popularized it, the Paci-Lorenz method—this tale of mishaps had not been told, and I, in the thirteen hips on which I practiced, was fortunate enough to have no such accidents, though the very extensive ecchymosis that followed the operation showed that a really decent amount of force had been used. The ecchymosis itself was of no moment, but I found that, out of thirteen cases in which I easily put the femoral head in or on the acetabulum, only one was an anatomical reduction, and could be counted on to stay reduced and to be a functional hip; one more was what is now called an anterior transposition. All the others were unqualified failures in that they reluxated, either in the plaster of Paris splints or very shortly after taking them out of these retentive dressings.

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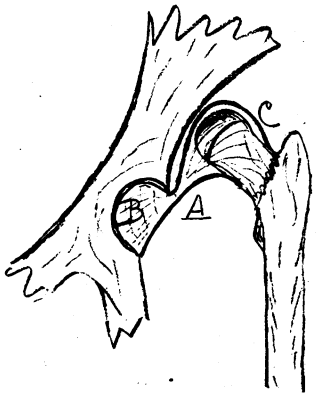
One success out of thirteen cases—for I do not count an anterior transposition a success—did not satisfy me. I abandoned the method in 1899 and have not returned to it. It is pertinent at this point to inquire if others were more fortunate than I in the method, and I quote again from the paper of Davis, already alluded to: In Schede's clinic, reported by Petersen, there were 113 cases with 6 cures. In Mikulicz's clinic, reported by Drehmann, of 128 hips in which the reposition is said to have been accomplished, in 70 it is stated to have been permanent, while in the others reluxations or transpositions were the final results.

Heusner, in 1899, considered the results excellent in 10 per cent of the cases, good after long treatment in 30 to 50 per cent, and unpromising in the rest. Ludloff claimed 9 satisfactory results in 11 cases. Kollicher reported only 2 cures in 51 hips, Codivilla 4 or 5 cures in 66 cases, and Kummel only about 5 per cent of cures. Hoffa then reported 5 cures in 64 hips. Wolff's claims were for 25 per cent cured. American operators have not done any better, and Kirmisson, of Paris, says that perfect reposition is rarely attained. Now Lorenz reported, in 1900, 108 anatomical results in 212 cases. This matches Mikulicz's statistics which gave something more than 50 per cent of successes. How can we reconcile these various statements? Davis says, "If one is critical, as is the case with Kirmisson, Hoffa, Kollicher, Schede, Codivilla, and others, then one will call 5 per cent cured. If one is more easily satisfied, then the cures will amount to 50 per cent, as in the case of Lorenz, or more, as in the case of Mikulicz." In this I wholly concur, for judging the work of Lorenz in the light of the cases and results he left scattered through America, I do not believe his anatomical results are any more than the average 5 to 10 per cent, and I cannot accept the reports from Mikulicz's clinic as representing the real facts there.

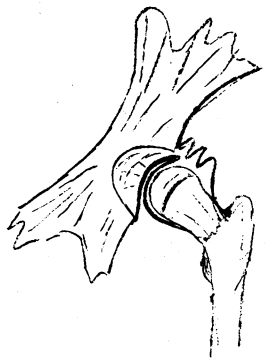
Now there are reasons, other than natural skepticism, other than statistics, for my doubting the statements of those reporting such high percentages of anatomical reductions, and they are these: I have opened, in all, 41 hips of this kind. In all but one I have found the condition originally described by



Showing Constricted Point (A) in Capsule - (B) Acetabulum. (C) Femoral Head.

Figure 1.

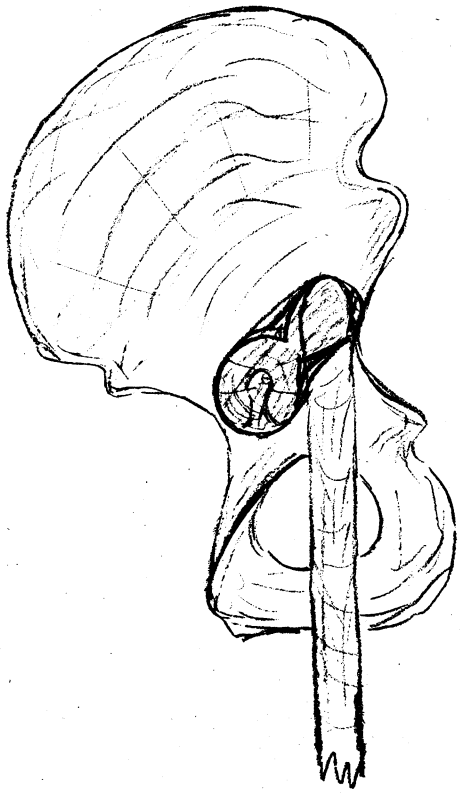
Lorenz long ago, a contraction of the capsule at the upper, or upper and posterior part of the acetabulum, at the place where the capsule leaves the acetabulum and reaches up to the displaced head. It is very like an hour glass contraction. Below it the capsule is stretched across the hollow of the acetabulum from rim to rim; above it the capsule is distended to envelop the head. Both above and below



Head put on, but not in The Acetabulum - Two layers of Capsule Interposed -

Figure 2.

the capsule has its normal attachments. The acetabulum occluded by the drum head arrangement of the capsule, Lorenz called the acetabular pocket, and



Posterior Location

Figure 3.

Bradford named the narrowed part in the capsule, the hymen of the acetabulum. Now this acetabular hymen must be ruptured to permit the penetration of the femoral head to the socket of the acetabulum. If this be not done the head is merely put on the capsule occluding the acetabulum, with a double layer of capsule between the two bony parts, and is, of course, in incomplete and unstable reposition. However, in the 41 cases of which I have definite surgical knowledge, this would have been possible in only one—in one case the acetabular hymen practically did not exist and the case would have been a perfect one for the manipulative method. In all the others the opening was so small that my forefinger could with difficulty be passed through it, and in some the passage was actually impossible to the finger. I am safe in

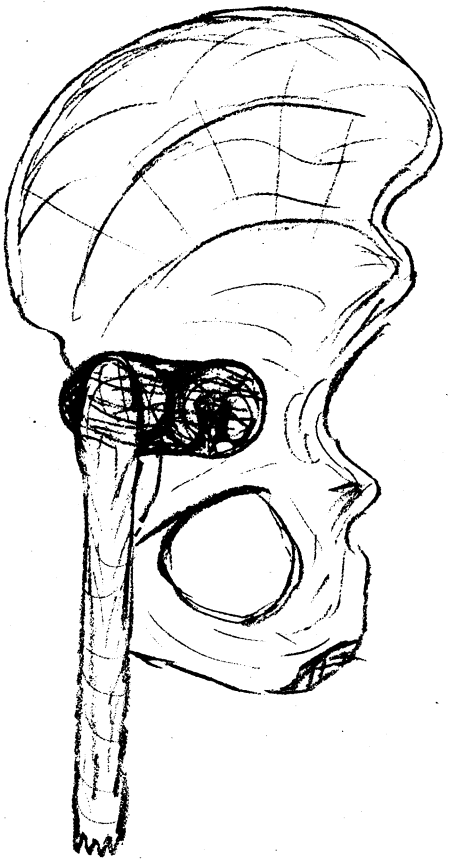


Figure 4.

the assertion that in not one of these forty cases could any one in the world have made an anatomical reposition by manipulation, and yet they were exactly like the cases in which Lorenz and Mikulicz were claiming over 50 per cent of cures.

What do these men really get who change the position of the femoral head but do not put it into the acetabulum? The result they secure Lorenz has called anterior transposition, the posterior location of the head on the dorsum of the ilium is changed for an anterior location, the head lying above and in front of the acetabulum, and, if possible, under the long head of the rectus femoris and the anterior inferior spine of the ilium, though in not a few cases the head—owing to the twist which is often present in the shaft of the femur—is directed forward, and does not get the somewhat stable position under the head of the rectus. This position is a better one than that on the dorsum, and the deforming lordosis is done away with, but the head is still outside the acetabulum, the support of the body must be by ligaments and not by natural bony parts. The leg is short, and there is a swaying limp in the walk to balance the trunk over the unstable joint. It may be granted that conditions are improved, but the goal sought has not been attained, the dislocation has not been reduced.

It has not seemed to me sensible or right to stop at this point. Surgeons who find mechanical obstacles to the reduction of a traumatic dislocation remove those obstacles by a cutting procedure. I am quite unable to see why cutting should be barred in this case when it is so universally resorted to in all other kinds of cases in all other parts of the body. To taboo the knife here and turn to it elsewhere is illogical. And it chances that but very little cutting is necessary and it can all be restricted to fibrous tissues, even the muscles being split and not cut. Acting on this idea I began in 1898 reducing congenital dislocations of the hip by means of an incision which laid open the acetabular hymen and gave free access for the head to the socket, and since then I have practiced no other method. The method really reduces, it puts the femoral head actually into the acetabulum, cartilage to cartilage. By it I can do the thing I set out to do. But I do not deepen the acetabulum and so expose cancellous bone and invite anchylosis, and the result is that all of the hips have motion. In the younger children, under six years old, this motion comes easily and naturally simply from the use of the limb. In the older children it comes more slowly but still it comes. The stability of the reposition depends, in the first place, on the mutual adaptation of the head and socket. If these are well suited to each other the reposition is stable; if either is incompetent—the socket too small or too shallow, or the head stunted and misshapen—the reposition is likely to be unstable and a supracotyloid reluxation to occur. This result can be sometimes averted by prolonging the splint restraint and making the parts work in contact, so that use together shall force a mutual remodelling. This is exactly what Lorenz does with the cases he subjects to the "bloodless" method. If after 8 to 12 months of being held together the head and socket still refuse to make a mechanical joint, either the time of splint restraint may be prolonged in the hope that the obdurate parts will yield, or the hip may be permitted to go into the supracotyloid luxation, accepting this position at the end of a treatment which has included real reduction and efficient and prolonged restraint in that position instead of accepting it at the beginning as an anterior transposition.

I have only operated in all on thirty hips by this method. I had the statistics regarding 28 of them looked up last April and they are equally good now, and have to be corrected in but one particular, the case of an eleven year old girl whose hip I reported as a stable reduction, but which I have since found to be a reluxation. I report now 30 hips in 21 children. The oldest was eleven years, the youngest ten months. Eighteen hips are known to be in stable reduction at times varying from six years to two months. Nine hips are known to be reluxated or subluxated. In three cases the final result is unknown. Studying these figures in the light of the failures, and taking cognizance of the improvement in my manual skill in the operation and the improvements which I have come to institute in the after treatment, I am inclined to believe that the stable repositions in young children should be 90 per cent, but this must be taken frankly as an optimal estimate, not as a statement of statistical facts.

The technique of the operation as I have come to do it, is as follows: The child is placed on the table with a sheet, rolled diagonally into a soft sort of rope,

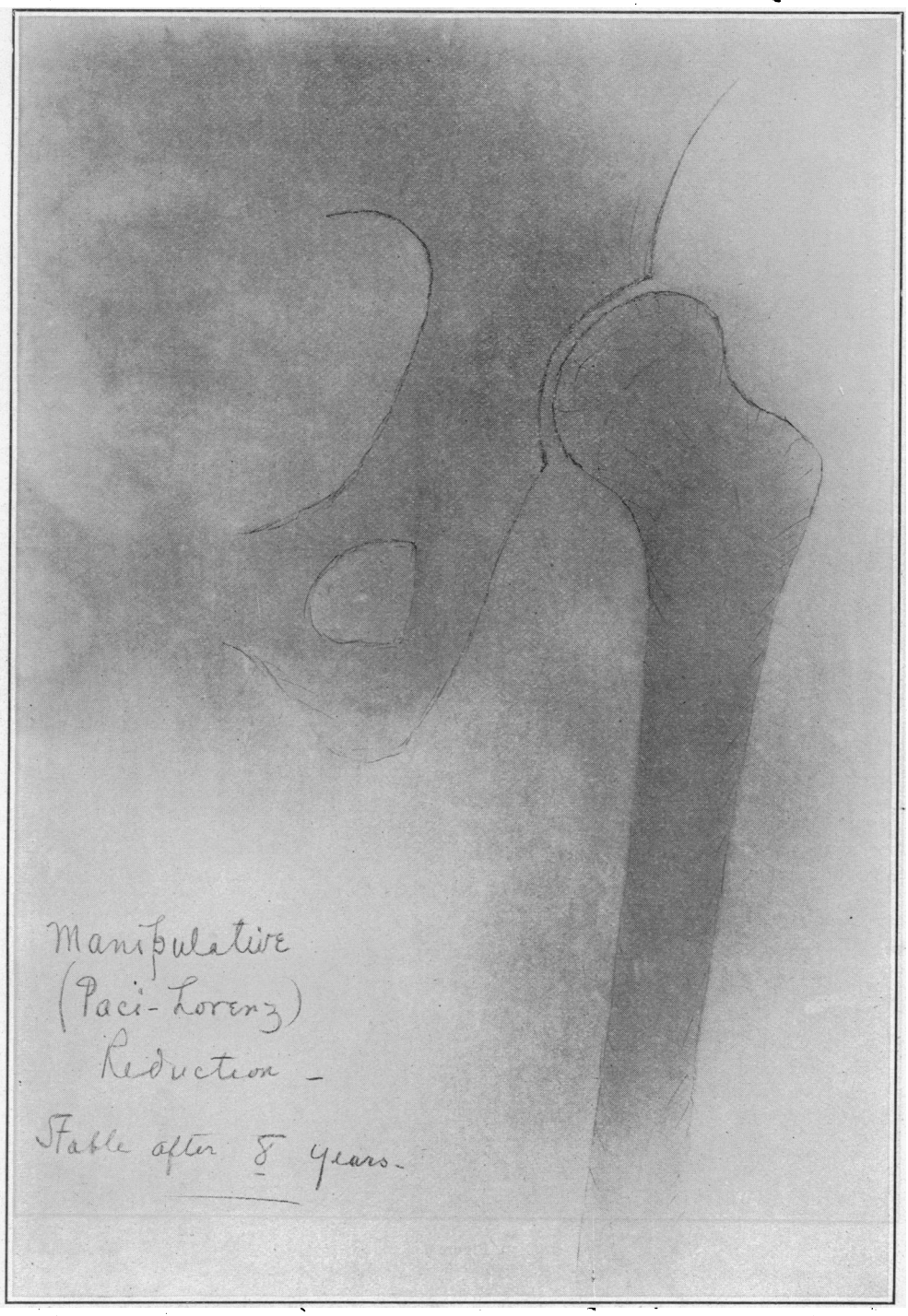


Figure 5.

Figures 5 and 6 show the similarity of the end results after successful manipulative reduction, and after reduction through an incision. Granting the value of the former includes the granting of the value of the latter.

between the thighs. The ends of this rolled sheet reach up beyond the child's head and are attached to a stout ring in the wall of the room. The part which is between the thighs is wrapped with a wet sterile towel and arranged so that it lies directly under and across the ischial tuberosity of the side on which the operation is to be done. It must not lie across or cover the genitalia. This sheet gives a safe and sufficient counter traction in case any amount of force is needed to pull the femoral head down to the level of the acetabulum. Around the thigh, just above the knee is fastened a skein of yarn, by a clove hitch, and another is put around the ankle in the same way. Traction on either or both of these is permissible, up to limits which seem safe, and that without injury to the skin.

A moderate pull is then made on the leg which draws the femoral head down from its usual location on the dorsum of the ilium and brings it just below the anterior superior iliac crest, where it is easily

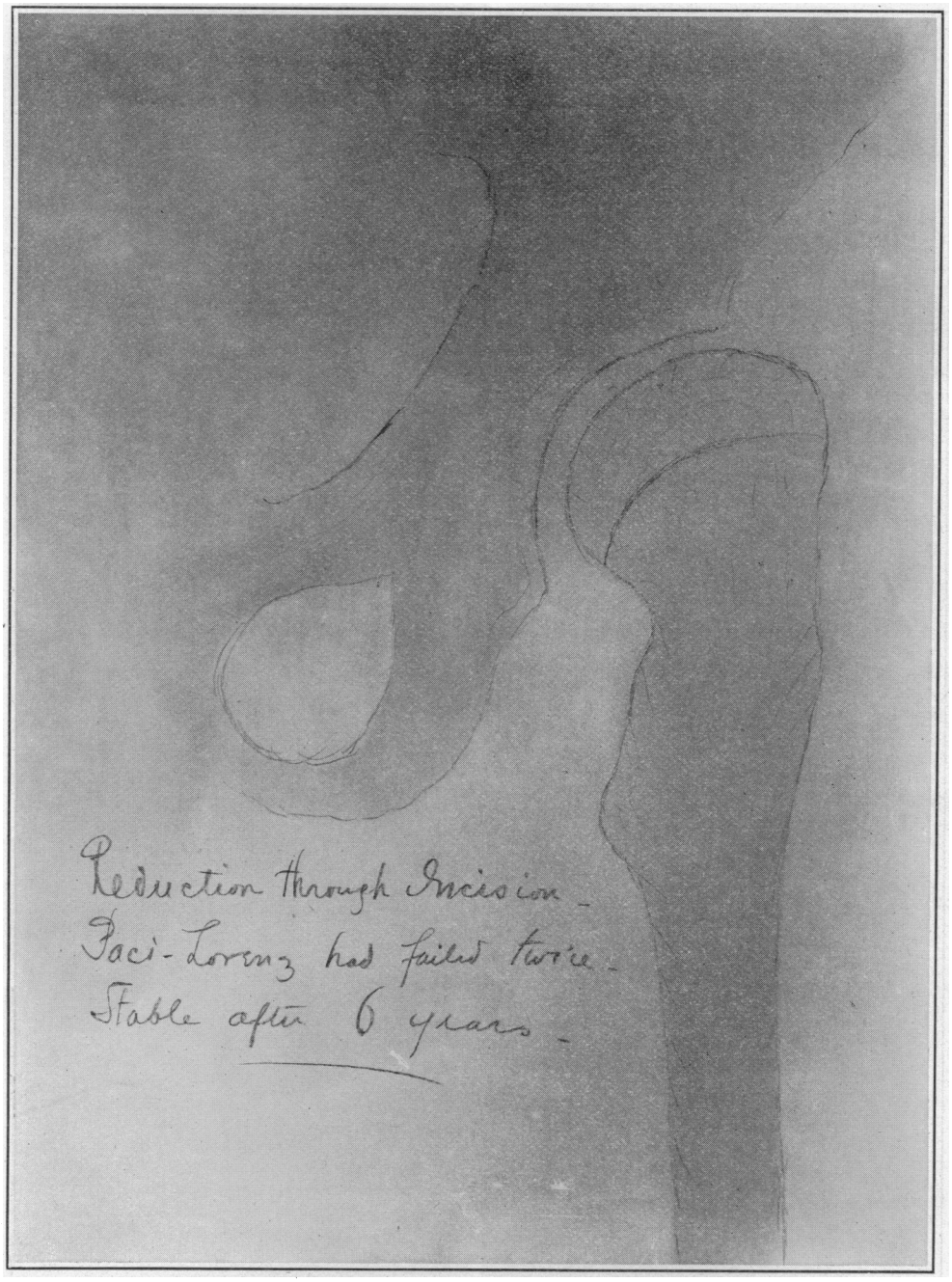


Figure 6.

palpable. The incision advised by Lorenz is then made; cutting skin, subcutaneous fascia, fascia lata, and finally the muscle and all in the direction of the muscular fibres so that these are separated and not cut. This exposes the capsule and it is incised in the same direction showing the femoral head inside it. Deep retractors have been used to hold the tissues apart, but now long loops of catgut are put in either side of the incision in the capsule and they act as retractors. In older children it is right to do a subcutaneous section of the adductor tendons close to the pubes.

The pull on the leg is now relaxed, the femoral head goes up and the gloved finger is slipped into the capsule and down toward the acetabulum. Very rarely indeed will it be able to enter the latter, though flexion of the hip relaxes the anterior part of the capsule and so makes the opening somewhat larger. On the finger, as a guide, a long, straight probe-pointed bistoury is passed into the acetabulum, and while the finger in the wound presses its edge downward against the lower part of the capsule, the hand on the outside slowly saws the knife to and fro. The cut thus made must be close to the femur and must especially avoid the anterior part of the capsule. Care must be taken not to cut off the ilio-psoas tendon, but the incision must be ample enough to give free access to the cavity of the acetabulum.

Now the femoral head is again pulled down from the dorsum of the ilium, by hand traction on the leg or on the yarn skeins, or, in older children, a tackle of blocks and rope may be used to overcome the re-

sistance of shortened muscle and fascia. When the head is over the acetabulum it may, in some instances, be thrust into the socket by firm pressure inward over the trochanter. Sometimes this maneuver has to be combined with abduction of the leg, made while the traction is maintained, the operator pressing the while firmly on the trochanter and supplying a fulcrum so that the head may be made to travel downward and inward and jump over the acetabular rim into the socket. There is one objection to the traction for it makes a pull on the anterior fibres of the capsule and narrows the opening, and so occasionally one finds that, after reasonable efforts at it, in which the capsule has probably become somewhat stretched, flexion of the hip and manipulation of the leg—the direction of the movements being guided by the finger in the joint—succeed in slipping the head into the acetabulum with the use of no force at all. In not a few instances, in young children, two to four years old, this may be done primarily, without the preliminary pull on the leg.

In a fair proportion of these cases there is a twist of the upper part of the femoral shaft so that the neck and head look forward when the toes are pointed in the same direction. Whether this is the case or not can always be determined by radiograms, one taken with the toes pointing forward and another with the limbs rotated out. If there is the twist forward in the bone, it will be necessary to compensate for it by rotating the whole limb inward during the manipulations to direct the head into the acetabulum. Once the head is in the acetabulum the limb is put into a position of abduction, of from 50° to 90°, and rotated in or not as may be necessary. This position thrusts the head more firmly into the acetabulum and prevents reluxation. The two retracting loops are now tied together to close the upper part of the incision in the capsule. The lower part of the incision has, by the act of reduction, been carried so deeply into the limb that it cannot be reached to be sutured. Sutures are then put in the fascia, deep and superficial, leaving space for the insertion of a cigarette drain down to the capsule. Finally the skin is sutured and then both limbs and the pelvis put into a double plaster of Paris spica. Even if but one hip is operated upon both limbs must be included in the first retentive plaster dressing. After forty-eight hours the drains are taken out, and, if there has been no sepsis, the leg is left undisturbed for three months. If sepsis occurs it is right to reluxate to avoid an anchylosed hip.

After three months the spica is taken off, and the limb adducted somewhat and another spica put on, including only the leg of the side of the operation in the one-sided cases, both legs in the double cases. After another month or so this may be arranged so as to leave the foot free, and the child may then be made to walk in the plaster. After six months have elapsed the spica may be made only to include the thigh and pelvis, leaving the knee free. After eight or nine months this retentive dressing may be left off entirely.

Southern California Hospitals.

The hospitals and sanatoria in the southland are almost constantly expanding and developing. Dr. Pottenger, Chairman of the Committee on Tuberculosis of the State Society, has met with remarkable success in the development of his sanatorium at Monrovia and has had to double its size, the addition being completed only recently. Already it is full and he is, we understand, contemplating still further expansion and equipment. The Good Samaritan Hospital in Los Angeles has recently installed what appears to be as nearly a perfect call system as it is possible to devise, together with many other improvements. The California Hospital, also in Los Angeles, has under way, and now nearly completed, a very considerable addition to its buildings. This new portion is built of brick, like the maternity pavilion, and adds largely to the accommodations of the hospital.

REPORT ON AN EPIDEMIC OF DIPHTHERIA.*

By RAY LYMAN WILBUR, M. D., Stanford University.

IT IS MY aim to present to you in this paper a brief report on forty-three cases of diphtheria that recently came under my observation, and also to outline the methods used to prevent the spread of the disease, particularly by the prophylactic injection of antitoxin. These forty-three cases do not represent all that occurred at the time of the epidemic, but only those actually seen by me either in consultation or as private patients.

In December 1903, and subsequent to that time, particularly during last June and July, several cases of diphtheria occurred in Palo Alto and on the Stanford University campus. Some of these cases were severe and one death resulted, but during the month of August there were no new cases. With the return of the students from their vacation early in September new cases began to appear. The origin of these early cases was obscure and in no one of them could be traced absolutely to a definite source. Some of the infected students reported diphtheria as prevalent in their home towns. In none of the early cases could a history be obtained pointing to contact with any previous diphtheria patient in the neighborhood, or with any apartment formerly occupied by such a patient. Many of the later cases that appeared were evidently from association with the earlier ones. A number of them came from two cases that were left, wrongly diagnosed, in a dormitory for almost a week. The first case of this series came under observation early in September and the last one was discharged the latter part of October.

General Character of the Cases. A majority of these cases were of the pharyngeal type and occurred in young adults although there were eleven children under ten years and two patients over forty years of age among them. While some of them were quite severe, the major portion of them were diagnosed early and were treated promptly by antitoxin so that the throat condition was not serious at any time. Four only of this series had a laryngeal affection; two of these being under three years of age. There were three buccal, one nasal, and one conjunctival infections, and three had post-diphtheritic paralysis or neuritic symptoms of some sort. None of the laryngeal cases required intubation although only the use of large doses of antitoxin promptly given and frequently repeated saved two of them from laryngeal occlusion. There were no deaths among the patients in this series and all but one were treated with diphtheria antitoxin. This one case was seen about four weeks after the appearance of the membrane for paralysis of the soft palate and a right hemiplegia, and the patient had been treated by a druggist by the use of gargles. The clinical diagnosis of most of the cases was easy. They usually began with headache, malaise, marked pain on swallowing, temperature up to a hundred and two degrees or a hundred and three degrees rapidly sinking to subnormal. Usually the throat had a purplish congested look, and the anterior cervical glands were swollen and tender. The membrane in the beginning was ordinarily of a greyish white color confined to the tonsils and adherent, its base bleeding readily when the membrane was disturbed. As a rule this spread rapidly to the soft palate. The uvula when involved usually became adherent to one of the tonsils.

It was found of great importance to carefully examine all throats with the aid of a head mirror and a swab or probe in order to detect a beginning membrane. Frequently small patches were found on the tonsil completely hidden by the anterior pillar, and a diagnosis was made by culture from them in time to prevent a severe involvement of the throat. In one case the patient had been seen by a physician

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